

DESCRIPTIONS OF ONE NEW GENUS AND TWO NEW SPECIES OF HYDROIDOMEDUSAE FROM TAIWAN STRAIT

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Abstract The Hydroidomedusae were collected from Taiwan Strait (20°51'–27°03'N, 114°55'–121°14'E) during July 2006 and Jan. 2007. Two new taxa *Paraephyrsilla taiwanensis* gen. nov. et sp. nov. and *Zygocanna planatus* sp. nov. are described. *Stomotoca atra* L. Agassiz, 1862 is a new record for Chinese waters.

Key words Medusae, Taxonomy, Taiwan Strait, *Paraephyrsilla taiwanensis*, *Zygocanna planatus*.

1 Introduction

The Taiwan Strait is located in the Southern East China Sea shelf (22°40'–26°N, 118°40'–121°E). It is a longitudinal narrow strait, lying between the east coast of Fujian and the west coast of Taiwan. The Taiwan Strait extends from southwest to northeast between the South China seas and East China seas. It covers 72 200 km², with an average depth close to 80 m and maximal depth of 140–150 m in the east-southern part of strait. Taiwan Strait belongs to the subtropical area, with its complicated ocean currents (sea temperature) and habitats (substratum), therefore has an enormously rich marine biodiversity.

About 298 species of the Hydrozoa (excluding Siphonophorae) are known from different habitats all over the Taiwan Strait (for a complete list, Xu *et al.*, in press). However, there are new published data on the comprehensive survey of organisms from Taiwan Strait. Based on data from two seasonal oceanographic cruises in Taiwan Strait, two new species, *Paraephyrsilla taiwanensis* gen. nov. et sp. nov., and *Zygocanna planatus* sp. nov. are described, *Stomotoca atra* L. Agassiz, 1862 is a new record for Chinese waters.

2 Material and Methods

Specimens were collected during planktonic cruises carried out at different stations in the Taiwan Strait (22°51'–27°03'N, 114°55'–121°14'E) during July 2006 and Jan. 2007. All planktonic samples were collected using a zooplankton net (80 cm diameter, 0.505 mm mesh size) by vertical towing from the bottom to the surface. Samples were preserved with 5% buffered formalin in seawater. Samples were examined using stereoscopic and light microscopy, and

taxonomic identification were undertaken using the literatures as specified in the reference section. Type specimens are deposited in the Third Institute of Oceanography, SOA, Xiamen, China.

Abbreviations are listed as follows, specimen (s): spm (s); Taiwan Strait: TS; State Ocean Administration, People's Republic of China: SOA; Xiamen University: XMU; Station (s): st (s); Collector (s): coll (s).

3 Taxonomic Account

Class Hydroidomedusa Claus, 1877

Subclass Anthomedusae Haeckel, 1879

Order Filifera Kühn, 1913

Family Pandeidae Haeckel, 1879

***Stomotoca atra* L. Agassiz, 1862 (Fig. 1)**

Stomotoca atra L. Agassiz, 1862: 347–348; Mayer, 1910: 111; Kramp, 1961: 115; Kramp, 1968: 44, fig. 112; Bouillon, 1980: 309, 337; Boero & Bouillon, 1989: 1–7, figs 4B, 5, 6; Bouillon *et al.*, 1991: 390–393, fig. 2; Bouillon *et al.*, 2006: 197, figs 99 G–H.

Type material Southern part of Taiwan Strait China, TS 064 (1 spm). st. JC-NH525 (21°37'N, 116°07'E; depth 131 m), 2 May 2007, WANG Yan-Guo (SOA).

Description. Umbrella 7 mm wide, flatter than a hemisphere, mesoglea thin, without apical projection; gastric peduncle with pyramidal base, shorter than the length of the manubrium, manubrium cylindrical, mounted upon the distal end of the peduncle, about half the length of manubrium extending beyond bell margin; mouth with four lanceolate lips, not crenulated but with crumpled margins; gonads in 8 adradial rows, well separated upon the side of the manubrium, each series consisting 5–6 transversal folds, reaching level of velar opening, eggs are

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produced on the folds; with 4 narrow radial canals, without wavy and small diverticula, extending from the circular canal to the peduncle and connected to the manubrium; with two long opposite marginal tentacles originating from triangular-elongate perradial tentacular bulbs, non-tentaculate perradial bulbs small, and 14 non-tentaculate bulbs quadrant, triangular, small; velum middle broad.

Remark. This medusa from Taiwan Strait has gastric peduncle; 4 radial canals without lateral diverticula, and without centripetal canals; mouth without crenulated lips; gonads in 8 well separated rows, with simple transverse folds; and numerous marginal rudimental tentacles. These features place this medusa in the family Pandeidae Haeckel, 1879, genus *Stomotoca* L. Agassiz, 1962.

Previously, only one species of *Stomotoca atra* L. Agassiz, 1862 is known (Bouillon *et al.*, 2006). The specimens from Taiwan Strait corresponded to the description by Mayer (1910), Karp (1968), Boero & Bouillon (1989) and Bouillon *et al.* (1991), but umbrella without bluntly-rounded apex or without sharply pointed apex; radial canals without wavy and small diverticula; decrease in number of rudimentary tentacles. Some of these may result from development process. This species is a new record for Chinese waters.

Distribution. Taiwan Strait, China; west coast of America (L. Agassiz, 1862), Papua New Guinea (Bouillon *et al.*, 1991), Vancouver Region (Foerster, 1923).

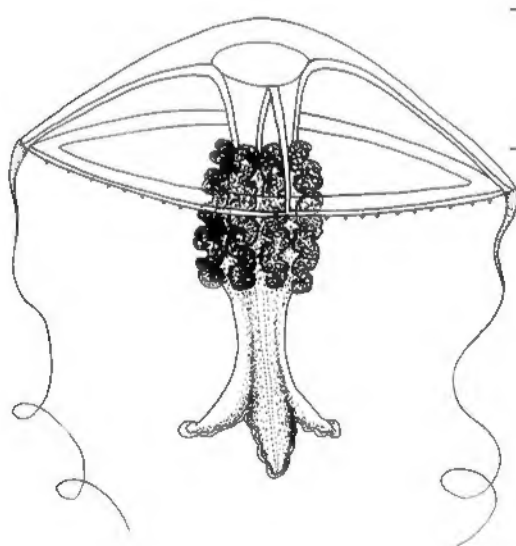


Fig. 1. *Stomotoca atra* L. Agassiz, 1862. Scale bar = 2 mm.

Order Capitata Kühn, 1913

Family Euphysidae Haeckel, 1879

Paraeuphysilla Xu, Huang *et* Guo, gen. nov.

Description. Euphysidae without exumbrellar

cnidocyst tracks; with 8 radial canals, of which 4 are broad and end in one large, nearly elliptical-shaped bulb; marginal bulb bears four equally developed tentacles with adaxial clasps and a terminal cnidocyst cluster, remainder 4 radial canals narrow, without marginal bulb, ending in ring canal; with gastric peduncle, manubrium large, mounted upon the distal end of the peduncle, extending beyond umbrella margin; mouth circular; gonad circular, surrounding all manubrium; no ocelli.

Type species. *Paraeuphysilla taiwanensis* Xu, Huang *et* Guo, sp. nov.

Etymology. The generic name *Paraeuphysilla* recalls the genus *Euphysilla*, but differs in having 8 radial canals instead of 4.

Discussion. This new genus has the main characters of the family Euphysidae. Diagnosis after Bouillon (1995a) slightly emended, the Euphysidae comprise the following genera: *Cnidocodon* Bouillon, 1978; *Euphysa* Forbes, 1848 (syn. *Hypolytus* Murbach, 1899; *Heteractis* Almann, 1864); *Euphysilla* Kramp, 1955; *Euphysomma* Kramp, 1962; *Meiorhopalon* Salvini-Plawen, 1987; *Pinushydra* Bouillon and Grohmann, 1990; *Siphonohydra* Salvini-Plawen, 1996. Only *Cnidocodon*, *Euphysa*, *Euphysilla* and *Euphysomma* have medusa stages (Bouillon & Boero, 2000). The new genus differs from the other genera of Euphysidae in having 8 radial canals instead of 4, and is similar to the genus *Euphysilla*, except for the presence of 8 radial canals. The new genus differs from the latter in manubrium, which is mounted upon the distal end of the peduncle, extending beyond umbrella margin. On the other hand, the genus *Euphysilla* is characterized by manubrium with quadratic base, no gastric peduncle, and not extending beyond umbrella margin (Table 1).

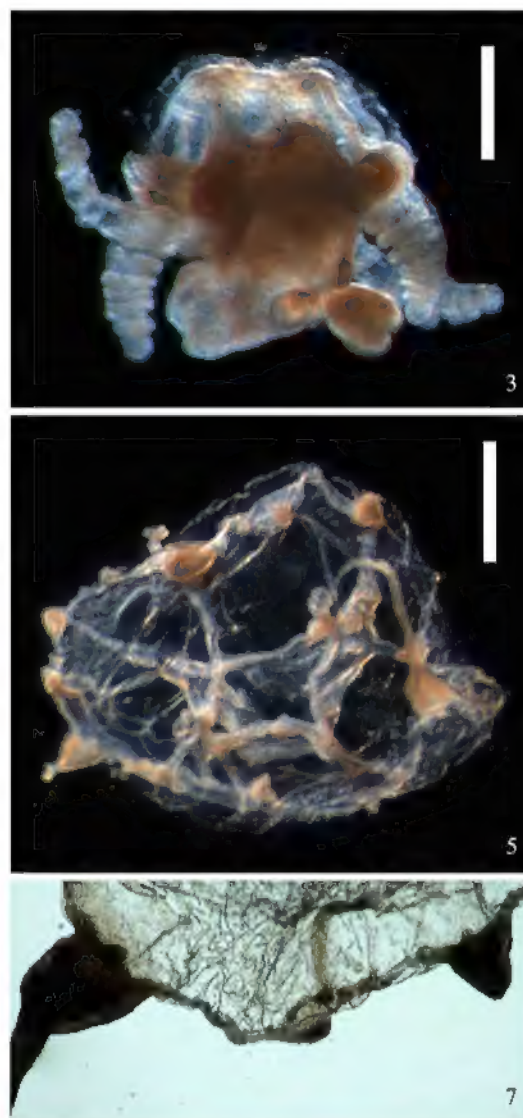
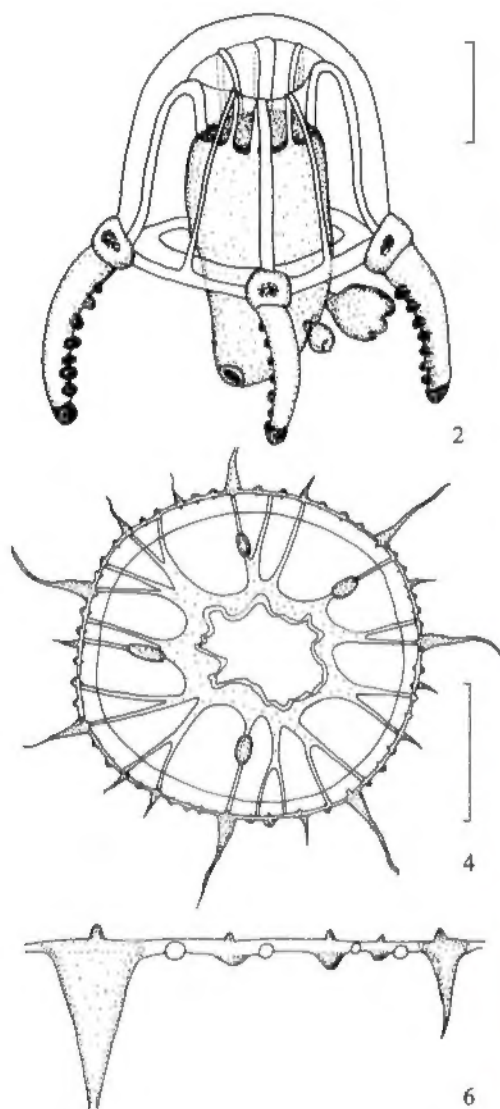
Key to the known genera (medusae) of family Euphysidae.

1. With 8 radial canals; manubrium longer than bell cavity; with gastric peduncle; with 4 equally developed tentacles with numerous adaxial transverse cnidocyst clasps and 1 small terminal cluster *Paraeuphysilla* gen. nov.
With 4 radial canals; without gastric peduncle 2
2. With 1–4 marginal tentacles, either unequally developed or of similar length, usually moniliform or modified moniliform *Euphysa*
With 4 marginal tentacles equally developed, not moniliform 3
3. Marginal tentacles elongated, with one row of cnidocyst clusters along all their length and with a terminal knob 4
Marginal tentacles very short, each dividing in 3–5 short capitate branches *Cnidocodon*
4. Base of manubrium quadrate, gonads circular along all length of manubrium; marginal tentacles with numerous adaxial (8–11) or abaxial (6–9) transverse cnidocyst clasps and 1 small terminal cluster *Euphysilla*
Base of manubrium circular; gonads circular, leaving aboral part of manubrium with short rounded apical chamber; marginal tentacles with 2–4 abaxial shortly peduncled cnidocyst knobs and 1 terminal cluster *Euphysomma*

Paraeuphysilla taiwanensis Xu, Huang *et* Guo, gen. nov. *et* sp. nov. (Figs 2–3)

Type material. South Taiwan Strait, China. Holotype, Taiwan Strait, TS 065 (1 spm), st. B9 (22°09'N, 118°26'E; depth 0–100 m), 11 July

2005, coll. GUO Dong-Hui (XMU). Paratype 1, Taiwan Strait, TS 066 (1 spm), st. C9 (21°40'N, 117°55'E; depth 0–105 m), 23 June 2006, coll. GUO Dong-Hui (XMU).



Figs 2–3. *Paraeuphysilla taiwanensis* sp. nov. Figs 4–7. *Zygocanna planatus* sp. nov. 2–3. Lateral view. 4–5. Oral view. 6–7. Umbrella margin. Scale bars: 2–3 = 0.5 mm, 4–5 = 2 mm.

Description. Medusa with bell-shaped umbrella, as broad as high or slightly higher, about 0.8–1.0 mm high, without apical projection; jelly evenly thin; without exumbrellar cnidocyst tracks; manubrium very voluminous, pear-shaped, about one-third the length of the manubrium extending beyond the velar opening; manubrium is mounted upon the distal end of broad and short peduncle; mouth simple, circular; gonads circular, surrounding all manubrium, and carries a group of two medusa-buds, arising from the lower part of the manubrium; 8

radial canals, of which 4 are broad and end in one large, nearly elliptical-shaped bulbs, containing reddish pigment granules; with four equally developed tentacles with 8–9 adaxial transverse cnidocyst clasps and 1 small terminal cluster; remainder 4 radial canals narrow without marginal bulbs; ending in ring canal; velum moderately broad.

Etymology. From Latin *taiwanensis*, Taiwan, referring to the first collected specimen from Taiwan Strait, China.

Distribution. South part of Taiwan Strait, China.

Subclass Leptomedusae Haeckel, 1866**Order Conida Broch, 1910****Family Aequoreidae Eschscholtz, 1829*****Zygocanna planatus* Xu, Huang et Wang, sp. nov.**
(Figs 4–7)

Type material. Southern part of Taiwan Strait, China. Holotype, TS 057 (1 spm), st. ZD-MJK571 (24°58'N, 120°28'E; depth 79 m), July 2006, coll. XIANG Peng (SOA). Paratypes 3, TS 058–060 (20 spms), specimens 17, total stations (24°20'–24°44'N, 119°31'–120°14'E; depth 46–70 m), July 2006, coll. XIANG Peng (SOA).

Description. Umbrella flatter than a hemisphere, about 3–8 mm wide; jelly thick at the apex, but thinner toward the bell margin; exumbrella smooth without radial ridges; no subumbrella radial bands of gelatinous papillae alternating with radial canals; manubrium about half as wide as diameter of umbrella, often broad and flat, without gastric peduncle; mouth broad, irregular polygon, with 5–6 lips, slightly crenulated; 4 gonads short and oval upon the proximal half of radial canals; radial canals divided into 1–3 branches outside manubrium, with 11–40 radial canals reaching ring canal; with 5–13 large tentacles, bulbs nearly conical-shaped, with 1–2 small tentacles and 3–8 rudimentary bulbs between large tentacles; all marginal bulbs with a distinct excretory papillae; with 1 statocyst between the tentacles and rudimentary bulbs or rudimentary bulbs, each statocyst containing 1 spherical concretion; velum present.

Etymology. From the Latin *planatus*, meaning planate. The species name refers to the exumbrella without radial ridges and no subumbrella gelatinous papillae.

Remark. This new species has radial canals numerous, branched; subumbrella without radial row of gelatinous papillae; manubrium without circular rows of papillae. These features place this medusa in the family Aequoreidae Eschscholtz, 1829, genus *Zygocanna* Haeckel, 1879 (Bouillon & Boero, 2000).

Previously, only 5 valid species of *Zygocanna* are known (Kramp, 1968; Bouillon et al., 2006). This new species has manubrium without gastric peduncle; exumbrella without radial ridges; radial canals branched outside manubrium. These features differ from the other species of *Zygocanna*, but similar to *Zygocanna buitendijki* Stiasny, 1928. While it can be separated from the latter by: 1) exumbrella without radial ribs; 2) radial canals divided 1–3 branches; 3)

with 11–40 radial canals reaching ring canal; 4) with 5–13 large tentacles bulbs nearly conical-shaped (Table 2).

Distribution. Southern part of Taiwan Strait, China.

Key to the species of *Zygocanna*.

1. Radial canals bifurcated 2
Radial canals branched more than once 4
2. Manubrium on large, conical peduncle
..... *Z. diploconus* (Haeckel, 1879)
No gastric peduncle 3
3. With 16–20 radial canals and 10–16 tentacles; exumbrella with 40–50 radial ridges; folded gonads are developed
..... *Z. pleuronota* (Péron & Lesueur, 1809)
With 12 radial canals and tentacles very numerous; exumbrella without radial ridges; gonads each forming a cluster of five parallel, serrated lamellae *Z. purpurea* (Péron & Lesueur, 1809)
4. Subumbrella with radial row of gelatinous papillae; roof of the manubrium presenting a cruciform structure bifurcating two or four times before reaching the manubrium periphery where the bifurcations give rise to about 30–45 non branched radial canals
..... *Z. vegans* Bigelow, 1913
Subumbrella without radial row of gelatinous papillae; radial canals branched outside manubrium 5
5. Exumbrella with 70–100 radial ribs containing hollow tubes; radial canals divided into 3–6 branches, about 80–100 reaching ring canals *Z. buitendijki* Stiasny, 1928
Exumbrella without radial ribs; radial canals divided 1–3 branches, about 11–40 reaching ring canal *Z. planatus* sp. nov.

REFERENCES

- Boero, F. and Bouillon, J. 1989. The life cycles of *Ocotiara russelli* and *Stomatoca atra* (Cnidaria, Anthomedusae, Pandeidae). *Zoologica Scripta*, 18: 1–7.
- Bouillon, J. 1980. Hydroméduses de la mer de Bismarck (Papouasie Nouvelle-Guinée). Partie III: Anthomedusae Filifera (Hydrozoa-Cnidaria). *Cahiers de Biologie Marine*, 21: 307–344.
- Bouillon, J. 1984. Hydroméduses de la mer de Bismarck (Papouasie Nouvelle-Guinée). Partie IV: Leptomedusae (Hydrozoa-Cnidaria). *Indo-Malayan Zoology*, 1: 25–112.
- Bouillon, J. 1995. Hydromedusae of the New Zealand Oceanographic Institute (Hydrozoa, Cnidaria). *New Zealand Journal of Zoology*, 22: 223–238.
- Bouillon, J. and Boero, F. 2000. Phylogeny and classification of Hydroidomedusae. *Thalassia Salentina*, 24: 1–296.
- Bouillon, J., Boero, F. and Seghers, G. 1991. Notes additionnelles sur les méduses de Papouasie Nouvelle-Guinée (Hydrozoa, Cnidaria) IV. *Cahiers de Biologie Marine*, 32: 387–411.
- Bouillon, J., Gravili, C., Pagès, F., Gili, J. M. and Boero, F. 2006. An introduction to Hydrozoa. *Mémoires du Muséum National d'Histoire Naturelle*, 194: 1–591.
- Kramp, P. L. 1961. Synopsis of the medusae of the world. *Journal of the Marine Biological Association of the United Kingdom*, 40: 1–459.
- Kramp, P. L. 1968. The Hydromedusae of Pacific and Indian Oceans. *Dana-Report*, 72: 1–200.
- Mayer, A. G. 1910. Medusae of the World. Carnegie Institution of Washington, Washington D. C. 1–735.
- Xu, Z.-Z., Huang, J.-Q., Lin, M., Guo, D.-H., and Wang, C.-G. (in press). Ecological zoogeography of Hydrozoa (excluding Siphonophora) in the Chinese inshore (Cnidaria). Taiwan Strait.

台湾海峡水螅水母纲一新属二新种记述

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摘要 记述台湾海峡生物综合调查区水螅水母纲 1 新属 2 新种, 即花水母亚纲面具水母科台湾似内胞水母 *Paraephyrsilla taiwanensis* Xu, Huang et Guo, gen. nov. et sp. nov. 与软水母亚纲多管水母科平枝多管水母 *Zygocanna planatus* Xu, Huang et Wang, sp. nov.。此外, 还报道了 1 种黑圆口水母 *Stomotoca atra* L. Agassiz, 1862 在我国海域首次记录。模式标本保存在国家海洋局第三海洋研究所。

似内胞水母, 新属 *Paraephyrsilla* Xu, Huang et Guo, gen. nov.

鉴别特征 水母外伞无刺胞带; 8 条辐管, 4 条辐管宽, 辐管基部有大的近椭圆形基球, 缘基球具有 4 条同样发达的触手, 每条触手的向轴内侧具横列刺胞丛, 末端球状; 另 4 条辐管窄, 无缘基球, 其末端与环管相连; 有胃柄; 垂管宽大, 超出伞缘; 生殖腺围绕着整条垂管; 无眼点。

词源: 新属以拉丁词 *Paraephyrsilla* 为属名, 意指该属与内胞水母属 *Euphyrsilla* Kramp, 1955 近似, 但新属有 8 条辐管, 不同于具 4 条辐管的内胞水母属。

台湾似内胞水母, 新属, 新种 *Paraephyrsilla taiwanensis* Xu, Huang et Guo, gen. nov. et sp. nov. (图 2~3)

关键词 水母, 分类, 台湾海峡, 台湾似内胞水母, 平枝多管水母。

中图分类号 Q959.14

鉴别特征 同属的特征。

正模 (TS 065), 台湾海峡 B9 站, 采集水层 0~100 m, 2005-07-11, 郭东晖采 (厦门大学)。副模 1 个 (TS 066), 台湾海峡 C9 站, 采集水层 0~105 m, 2006-06-23, 郭东晖采 (厦门大学)。

词源: 新种种名源自采集地台湾。

平枝多管水母, 新种 *Zygocanna planatus* Xu, Huang et Wang, sp. nov. (图 4~7)

鉴别特征 伞扁于半球形, 内伞无胶质辐射状排列的乳突, 外伞光滑无肋; 辐管分叉在胃和伞缘之间进行, 辐管分叉不规则, 分 1~3 叉, 有 11~40 条辐管与环管相连; 大触手 5~13 条, 每 2 条大触手间有 1~2 条小触手和 3~8 个缘疣, 触手和缘疣具有发达的排泄乳突。

正模 (TS 057), 台湾海峡 ZD-MJK571 站, 水深 79 m。副模 3 个 (TS 058-060), 此外还有 17 个标本, 台湾海峡, 水深 46~70 m, 2006-07, 项鹏采 (第三海洋研究所)。

词源: 新种种名以拉丁词 *planatus* 为种名, 意为平滑, 指新种外伞无肋, 内伞无辐射状排列的乳突。

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